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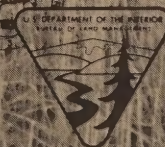
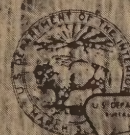
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FORT UNION COAL

AGRICULTURAL ECONOMICS

TRACT REPORTS

DECEMBER 1981



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BLOOMFIELD TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 12,892 acres of tract lands is \$380,200 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$29.49 per acre. The value of all agricultural production for Dawson County, in which this Bloomfield tract is located, was \$21,444,000 in 1978 (Census of Agriculture—1978).

Farm—Ranch Operations

The tract contains 12,892 acres of farm land operated by 21 ranchers and farmers who also operate 35,861 acres of land outside the tract (Table 3 Bloomfield, Site Specific Analysis). The average farm operation contains 2,322 acres of which 828 acres are small grains, 80 acres of hay, 639 acres of grazing land, and 775 acres of fallow and other.

On the basis of a representative farm classification, the 21 farms are classified as 8 small crop farms, 10 large crop farms, and 3 combination crop-livestock farms. Available data shows no large livestock farms within the tract.

Thirty-seven percent of the land within the tract was leased by 10 operators. Six operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 38 percent leasing of all land operated.

The gross farm income for representative farms is \$33,000 (small crop), \$82,200 (crop-livestock), and \$188,200 (large livestock). The average for the 21 farms is \$71,300.

Net farm incomes are \$8,400, \$25,300, and \$19,600 respectively for the three farm types. The average for all farms is \$18,100 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farm assumes a 60 cow herd with cow-calf operations. On the livestock farms, about 59 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural pro-

duction that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Bloomfield tract is 30 years with a ten to fifteen year reclamation period. Based on a 15 year reclamation period, the peak mining period is 15 years. During the peak years, 50 percent of the tract acreage would be displaced from agricultural use. Some of the land would be involved in mining operations for 45 years.

On an average basis there would be 429 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$12,500. During the peak mining years 6,435 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$188,000 annually. This value represents about 0.88 percent of the value of Dawson County's annual agricultural production.

Loss in net agricultural income (value) during peak mining would be \$73,200 annually. The present value of this loss over the life of the mine would be \$387,200. The present value of net agricultural income loss per million tons of coal mined would be \$920.

Farm—Ranch Operations

During the peak mining years, 6,435 acres would be out of production at a given time and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year.

All of the operations have less than 6,435 acres within the tract. Therefore, it is possible that each of these operators could have all of their land within the tract out of agricultural production at some point in the life of the mine. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (7) fall in the large cash crop class with a minor to 25 percent reduction in acreage. Loss in net income for the seven model large cash crop operations is about \$9.53 per acre. This loss in income is based on leasing 38 percent of all land operated. The present value of losing this income in perpetuity at 10 percent interest would be \$95.00 per acre.

Overall, the loss in net income for all operators would average \$11.38 per acre. This loss would occur annually, whereas coal is a one-time harvest. The present value of losing this income in perpetuity at 10 percent interest would be about \$115 per acre.

Impact of strip mining on the operation and management of livestock ranches could be more severe than

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
BLOOMFIELD TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	1,320	33,000	8,400	3	3,000	1	5,900	0	7,700	4	11,500 ³
Large Cash Crop	3,860	98,700	25,300	7	9,200	2	19,000	1	28,600	0	36,400
Crop & Livestock	3,860	82,200	19,600	1	7,300	1	15,700	0	24,400	1	52,300
Small Livestock	7,200	125,900	13,900	0	5,700	0	13,200	0	23,000	0	32,400
Large Livestock	12,790	188,200	1,700	0	3,800	0	9,200	0	15,600	0	31,600
Extra Large Livestock	29,000	326,000	30,100	0	15,00	0	28,100	0	19,300	0	61,000

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangement, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,300 per acre if grazing land is involved. This compensation would occur over a period of time and would result from rental, bonus, royalty, and damage payments. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$725 per acre in the Bloomfield tract.

Based on this analysis, it appears that a farm/ranch operator that leases 38 percent of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. On the average, about 74 percent of the land operated by the six affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the average \$11.38 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid. One

operator has all, and two operators have 50 percent of their operations under lease in the tract and would be totally removed from, or severely impacted during the peak mining years.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 10, Bloomfield, Site Specific Analysis) mentions that five known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality or quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U. S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Coal development would compete directly with agricul-

CENTRAL SLOOPFIELD TRACT

ture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry could provide. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 99 farm operators in Dawson County reported working 200 days or more off the farm. This is 18 percent of the total farm operators in the county. Also, as agricultural land is taken out of production,

there would be a small decrease in the need for farm labor. This would amount to about 3,100 hours annually during peak mining years.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

ENVIRONMENTAL CONSEQUENCES

Visual Quality and Scenery

There are no visual quality or scenery impacts from

the proposed action. The proposed action is a land use change that would allow for the development of a new coal mine. The proposed action would not result in any new construction or any other activity that would affect the visual quality or scenery of the area.

The proposed action would not result in any new construction or any other activity that would affect the visual quality or scenery of the area.

CENTRAL BLOOMFIELD TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 8,213 acres of tract lands is \$227,100 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$27.65 per acre. The value of all agricultural production for Dawson County, in which this Central Bloomfield tract is located, was \$21,444,000 in 1978 (Census of Agriculture—1978).

Farm—Ranch Operations

The tract contains 8,213 acres of farm land operated by 16 ranchers and farmers who also operate 29,126 acres of land outside the tract (Table 3 Central Bloomfield, Site Specific Analysis). The average farm operation contains 2,334 acres of which 826 acres are small grains, 67 acres of hay, 672 acres of grazing land, and 769 acres of fallow and other.

On the basis of a representative farm classification, the 16 farms are classified as 8 small crop farms, 6 large crop farms, and 2 combination crop-livestock farms. Available data shows no large livestock farms within the tract.

Thirty-seven percent of the land within the tract was leased by 6 operators. Three operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 38 percent leasing of all land operated.

The gross farm income for representative farms is \$33,000 (small crop), \$82,200 (crop-livestock), and \$98,700 (large crop). The average for the 16 farms is \$63,800.

Net farm incomes are \$8,400, \$19,600, and \$25,300 respectively for the three farm types. The average for all farms is \$16,200 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farm assumes a 60 cow herd with cow-calf operations. On the livestock farms, about 59 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural pro-

duction that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Central Bloomfield tract is 40 years with a ten to fifteen year reclamation period. Based on a 15 year reclamation period, the peak mining period is 25 years. During the peak years, 38 percent of the tract acreage would be displaced from agricultural use. Some of the land would be involved in mining operations for 55 years.

On an average basis there would be 205 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$5,700. During the peak mining years 3,075 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$85,100 annually. This value represents about 0.39 percent of the value of Dawson County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$31,300 annually. The present value of this loss over the life of the mine would be \$171,000. The present value of net agricultural income loss per million tons of coal mined would be \$655.

Farm—Ranch Operations

During the peak mining years, 3,075 acres would be out of production at any given time and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year.

All of the operations have less than 3,075 acres within the tract. Therefore, it is possible that each of these operators could have all of their land within the tract out of agricultural production at some point in the life of the mine. The consequences of this are shown on Table 1.

The largest number of farm/ranch operators (6) fall in the small cash crop with a minor to 25 percent reduction in acreage. Loss in net income for the six model small cash crop operations is about \$9.09 per acre. This loss in income is based on leasing 38 percent of all land operated. The present value of losing this income in perpetuity at 10 percent interest would be about \$90 per acre.

Overall, the loss in net income for all operators would average \$10.18 per acre. This loss would occur annually, whereas coal is a one-time harvest. The present value of losing this income in perpetuity at 10 percent interest would be about \$100 per acre.

Impact of strip mining on the operation and manage-

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
CENTRAL BLOOMFIELD TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	1,320	33,000	8,400	6	3,000	0	5,900	0	7,700	2	11,500 ³
Large Cash Crop	3,860	98,700	25,300	5	9,200	1	19,000	0	28,600	0	36,400
Crop & Livestock	3,860	82,200	19,600	0	7,300	1	15,700	0	24,400	1	52,300
Small Livestock	7,200	125,900	13,900	0	5,700	0	13,200	0	23,000	0	32,400
Large Livestock	12,790	188,200	1,700	0	3,800	0	9,200	0	15,600	0	31,600
Extra Large Livestock	29,000	326,000	30,100	0	15,00	0	28,100	0	19,300	0	61,000

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

ment of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,300 per acre if grazing land is involved. This compensation would occur over a period of time and would result from rental, bonus, royalty and damage payments. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$700 per acre in the Central Bloomfield tract.

Based on this analysis, it appears that a farm/ranch operator that leases 38 percent of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. On the average, about 78 percent of the land operated by the sixteen affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the average of \$10.18 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid.

One operator has all, and one has half of their operations under lease in the tract and would be totally removed from, or severely impacted during the peak mining years.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 10, Central Bloomfield, Site Specific Analysis) mentions that two known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality or quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U. S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Coal development would compete directly with agriculture for labor resources as both industries place a pre-

mium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors. Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry could provide. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 99 farm operators in Dawson County reported working 200 days or more off the farm. This is 18 percent of the total farm operators in the county. Also, as agricultural land is taken out of

production, there would be a small decrease in the need for farm labor. This would amount to about 2,000 hours annually during peak mining years.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers. A technical report is available which discusses the methodology used in the agricultural economic analysis.

Figure 1 - Peak Operations

The following table shows the peak operations for the various types of mining in the county. The data is based on the 1978 survey of farm operators. The table shows the number of operators, the number of days worked, and the number of hours worked. The data is presented in a table format.

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ENVIRONMENTAL CONSIDERATIONS

Visual and Aesthetic Considerations

The following table shows the peak operations for the various types of mining in the county. The data is based on the 1978 survey of farm operators. The table shows the number of operators, the number of days worked, and the number of hours worked. The data is presented in a table format.

The following table shows the peak operations for the various types of mining in the county. The data is based on the 1978 survey of farm operators. The table shows the number of operators, the number of days worked, and the number of hours worked. The data is presented in a table format.

BURNS CREEK TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 16,330 acres of tract lands is \$285,300 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$17.47 per acre. The value of all agricultural production for Dawson County, in which this Burns Creek tract is located, was \$21,444,000 in 1978 (Census of Agriculture—1978).

Farm—Ranch Operations

The tract contains 16,330 acres of farm land operated by 11 ranchers and farmers who also operate 30,625 acres of land outside the tract (Table 3 Burns Creek, Site Specific Analysis). The average farm operation contains 4,269 acres of which 423 acres are small grains, 59 acres of hay, 3,380 acres of grazing land, and 407 acres of fallow and other.

On the basis of a representative farm classification, the 11 farms are classified as 1 small crop farm, 9 combination crop-livestock farms, and 1 small livestock farm. Available data shows no large crop or livestock farms within the tract.

Forty-two percent of the land within the tract was leased by 6 operators. Three operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 38 percent leasing of all land operated.

The gross farm income for representative farms is \$33,000 (small crop), \$82,200 (crop-livestock), and \$125,900 (small livestock). The average for the 11 farms is \$81,700.

Net farm incomes are \$8,400, \$19,600, and \$13,900 respectively for the three farm types. The average for all farms is \$18,100 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farm assumes a 60 cow herd, and the small livestock farm a 200 cow herd with cow-calf operations. On the livestock farms, about 59 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural pro-

duction that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Burns Creek tract is 40 years with a ten to fifteen year reclamation period. Based on a 15 year reclamation period, the peak mining period is 25 years. During the peak years, 38 percent of the tract acreage would be displaced from agricultural use. Some of the land would be involved in mining operations for 55 years.

On an average basis there would be 414 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$7,100. During the peak mining years 6,210 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$106,500 annually. This value represents about 0.50 percent of the value of Dawson County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$38,200 annually. The present value of this loss over the life of the mine would be \$208,800. The present value of net agricultural income loss per million tons of coal mined would be \$360.

Farm—Ranch Operations

During the peak mining years, 6,210 acres would be out of production at some time and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. All of the operations have less than 6,210 acres within the tract. Therefore, it is possible that each of these operators could have all of their land within the tract out of agricultural production at some point in the life of the mine. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (4) fall in the crop livestock class with a minor amount to 25 percent reduction in acreage. Loss in net income for the four model crop-livestock operations is about \$7.56 per acre annually. This loss in income is based on leasing 38 percent of all land operated. The present value of losing this income in perpetuity at 10 percent interest would be about \$75.00 per acre.

Overall, the loss in net income for all operators would average \$6.15 per acre. This loss would occur annually, whereas coal is a one-time harvest. The present value of losing this income in perpetuity at 10 percent interest would be about \$60.00 per acre.

Impact of strip mining on the operation and management of livestock ranches could be more severe than

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TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
BURNS CREEK TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	1,320	33,000	8,400	0	3,000	1	5,900	0	7,700	0	11,500 ³
Large Cash Crop	3,860	98,700	25,300	0	9,200	0	19,000	0	28,600	0	36,400
Crop & Livestock	3,860	82,200	19,600	4	7,300	2	15,700	3	24,400	0	52,300
Small Livestock	7,200	125,900	13,900	1	5,700	0	13,200	0	23,000	0	32,400
Large Livestock	12,790	188,200	1,700	0	3,800	0	9,200	0	15,600	0	31,600
Extra Large Livestock	29,000	326,000	30,100	0	15,00	0	28,100	0	19,300	0	61,000

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,300 per acre if grazing land is involved. This compensation would occur over a period of time and would result from rental, bonus, royalty and damage payments. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$700 per acre in the Burns Creek tract.

Based on this analysis, it appears that a farm/ranch operator that leases 38 percent of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. On the average, about 65 percent of the land operated by the eleven affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$6.15 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid. Two of the operators have half of their operations under lease in

the tract and would be severely impacted during the peak mining years.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 10, Burns Creek Site Specific Analysis) mentions that eleven known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U. S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Coal development would compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working

long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry could provide. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 99 farm operators in Dawson County reported working 200 days or more off the farm. This is 18 percent of the total farm operators in the county. Also, as agricultural land is taken out of production,

there would be a small decrease in the need for farm labor. This would amount to about 3,300 hours annually during peak mining years.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

Farm-Ranch Operations

The Circle West Tract is located in the northwestern corner of Dawson County, Georgia. It is a 1,000-acre tract that is currently owned by the Georgia Department of Transportation. The tract is currently used for the storage of materials and equipment for the Georgia Department of Transportation. The tract is currently used for the storage of materials and equipment for the Georgia Department of Transportation.

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ENVIRONMENTAL CONSEQUENCES

In 1978, a total of 99 farm operators in Dawson County reported working 200 days or more off the farm. This is 18 percent of the total farm operators in the county. Also, as agricultural land is taken out of production,

CIRCLE WEST I TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 9,859 acres of tract lands is \$124,200 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$12.60 per acre. The value of all agricultural production for McCone County, in which this Circle West I tract is located, was \$21,040,000 in 1978 (Census of Agriculture—1978).

Farm—Ranch Operations

The tract contains 9,859 acres of farm land operated by 6 ranchers and farmers who also operate 81,508 acres of land outside the tract (Table 3 Circle West I, Site Specific Analysis). The average farm operation contains 15,228 acres of which 793 acres are small grains, 122 acres of hay, 13,896 acres of grazing land, and 417 acres of fallow and other.

On the basis of a representative farm classification, the 6 farms are classified as 1 small crop farm, 1 combination crop-livestock farm, 1 small livestock farm, 1 large livestock farm, and 2 extra large livestock farms. Available data shows no large crop farms within the tract.

Thirty percent of the land within the tract was leased by 3 operators. Representative farms used in the income analysis assume 38 percent leasing of all land operated.

The gross farm income for representative farms is \$33,000 (small crop), \$82,200 (crop-livestock), \$125,900 (small livestock), \$188,200 (large livestock), and \$326,000 (extra large livestock). The average for the 6 farms is \$180,200.

Net farm incomes are \$8,400, \$19,600, \$13,900, \$1,700, and \$30,100 respectively for the five farm types. The average for all farms is \$10,000 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farm assumes a 60 cow herd, the small livestock farm a 200 cow herd, the large livestock farm a 400 cow herd and the extra large livestock farm a 700 cow herd with cow-calf operations. On the livestock farms, about 59 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural production that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Circle West I tract is 40 years with a ten to fifteen year reclamation period. Based on a 15 year reclamation period, the peak mining period is 25 years. During the peak years, 38 percent of the tract acreage would be displaced from agricultural use. Some of the land would be involved in mining operations for 55 years.

On an average basis there would be 247 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$3,100. During the peak mining years 3,705 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$46,500 annually. This value represents about 0.22 percent of the value of McCone County's annual agricultural production.

Loss in net agricultural income (value) during peak mining would be \$11,400 annually. The present value of the loss over the life of the mine at 10 percent interest would be \$62,300. The present value of net agricultural income loss per million tons of coal mined would be \$290.

Farm—Ranch Operations

During the peak mining years, 3,705 acres would be out of production at any given time and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Five of the operations have less than 3,705 acres within the tract. Therefore, it is possible that each of these operators could have all of their land within the tract out of agricultural production at some point in the life of the mine. The consequences of this are shown on Table 1. The one large operator has about twice as much land within the tract than would be out of production during peak mining. Therefore, about half of this operator's land within the tract could be out of production during peak mining. Since about 32 percent of this operator's land is within the tract, this could result in about 16 percent of the operator's entire farm/ranch being out of production at one point in the life of the mine.

The majority of the operators (4) would have less than 4 percent of their total acreage out of agricultural production during peak mining.

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
CIRCLE WEST I TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	1,320	33,000	8,400	1	3,000	0	5,900	0	7,700	0	11,500 ³
Large Cash Crop	3,860	98,700	25,300	0	9,200	0	19,000	0	28,600	0	36,400
Crop & Livestock	3,860	82,200	19,600	0	7,300	1	15,700	0	24,400	0	52,300
Small Livestock	7,200	125,900	13,900	1	5,700	0	13,200	0	23,000	0	32,400
Large Livestock	12,790	188,200	1,700	1	3,800	0	9,200	0	15,600	0	31,600
Extra Large Livestock	29,000	326,000	30,100	2	15,00	0	28,100	0	19,300	0	61,000

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

Loss in net income for the four model livestock operations varies from about \$1.20 per acre to \$3.20 per acre. This loss in income is based on leasing 38 percent of all land operated. The reason the loss in income is low per acre is because most of it is grazing land.

Over all, the loss in net income for all operators would average \$3.06 per acre. This loss would occur annually, whereas coal is a one-time harvest. The present value of losing this income in perpetuity at 10 percent interest would be \$30.60 per acre.

Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating land owners up to as high as \$1,300 per acre if grazing land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$500 per acre in the Circle West I tract.

Based on this analysis, it appears that a farm/ranch operator that leases 38 percent of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. On the average, about 90 percent of the land operated by the six affected farmers/ranchers lies outside the tract. Depending upon

the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$3.06 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 17, Circle West I Site Specific Analysis) mentions that nine known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in any detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality or quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as

theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Coal development would compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry could provide. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 68 farm operators in McCone County reported working 200 days or more off the farm. This is 15 percent of the total farm operators in the county.

Also, as agricultural land is taken out of production, there would be a small decrease in the need for farm labor. This would amount to about 1,400 hours annually during peak mining years.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

The technical report is available which discusses the methodology used in the agricultural economic analysis.

CIRCLE WEST II TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 11,024 acres of tract lands is \$170,400 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$15.45 per acre. The value of all agricultural production for McCone County, in which this Circle West II tract is located, was \$21,040,000 in 1978 (Census of Agriculture—1978).

Farm—Ranch Operation

The tract contains 11,024 acres of farm land operated by 4 ranchers and farmers who also operate 64,146 acres of land outside the tract (Table 3 Circle West II, Site Specific Analysis). The average farm operation contains 18,793 acres of which 1,058 acres are small grains, 114 acres of hay, 17,062 acres of grazing land, and 559 acres of fallow and other.

On the basis of a representative farm classification, the 4 farms are classified as 1 combination crop-livestock farm, 1 large livestock farm, and 2 extra large livestock farms. Available data shows no crop farms within the tract.

Forty-five percent of the land within the tract was leased by 3 operators. Representative farms used in the income analysis assume 38 percent leasing of all land operated.

The gross farm income for representative farms is \$82,200 (crop-livestock), \$188,200 (large livestock), and \$326,000 (extra large livestock). The average for the 4 farms is \$230,600.

Net farm incomes are \$19,600, \$13,900, and \$1,700 respectively for the three farm types. The average for all farms is \$20,400 per farm. These incomes are available for family labor and return on investment.

The crop-livestock farm assumes a 60 cow herd, the large livestock farm a 400 cow herd and the extra large livestock farms a 700 cow herd with cow-calf operations. On the livestock farms, about 59 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural production that would be displaced if coal were mined.

Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Circle West II tract is 40 years with a ten to fifteen year reclamation period. Based on a 15 year reclamation period, the peak mining period is 25 years. During the peak years, 38 percent of the tract acreage would be displaced from agricultural use. Some of the land would be involved in mining operations for 55 years.

On an average basis there would be 276 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$4,320. During the peak mining years 4,140 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$64,800 annually. This value represents about 0.31 percent of the value of McCone County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$11,100 annually. The present value of this loss over the life of the mine would be \$60,700. The present value of net agricultural income loss per million tons of coal mined would be \$245.

Farm—Ranch Operations

During the peak mining years, 4,140 acres would be out of production at some time and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Three of the operations have less than 4,140 acres within the tract.

Therefore, it is possible that each of these operators could have all of their land within the tract out of agricultural production at some point in the life of the mine. The consequences of this are shown on Table 1. One large operator has about twice as much land within the tract than would be out of production during peak mining. Therefore, about half of this operator's land within the tract could be out of production during peak mining. Since about 21 percent of this operator's land is within the tract, this could result in about 11 percent of the operator's entire farm/ranch being out of production at one point in the life of the mine.

Loss in net income for the two model extra large livestock operations is about \$2.07 per acre. This loss in income is based on leasing 38 percent of all land operated. The reason the loss in income is low per acre is because most of it is grazing land.

Overall, the loss in net income for all operators would average \$2.68 per acre annually. This loss would occur annually, whereas coal is a onetime harvest. The pres-

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
CIRCLE WEST II TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	1,320	33,000	8,400	0	3,000	0	5,900	0	7,700	0	11,500 ³
Large Cash Crop	3,860	98,700	25,300	0	9,200	0	19,000	0	28,600	0	36,400
Crop & Livestock	3,860	82,200	19,600	0	7,300	0	15,700	1	24,400	0	52,300
Small Livestock	7,200	125,900	13,900	0	5,700	0	13,200	0	23,000	0	32,400
Large Livestock	12,790	188,200	1,700	1	3,800	0	9,200	0	15,600	0	31,600
Extra Large Livestock	29,000	326,000	30,100	2	15,00	0	28,100	0	19,300	0	61,000

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

ent value of losing this income in perpetuity at 10 percent interest would be about \$27.00 per acre.

Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,300 per acre if grazing land is involved. This level of compensation would be over a period of time and would result from rental, bonus, royalty and damage payments. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$500 per acre in the Circle West II tract.

Based on this analysis, it appears that a farm/ranch operator that leases 38 percent of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. On the average, about 85 percent of the land operated by the four affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the average \$2.68

per acre annually. Lost income would be the profit that is now being realized from the lease after the rent is paid.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 7, Circle West II Site Specific Analysis) mentions that seven known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality or quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Coal development would compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are

accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry could provide. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 68 farm operators in McCone County reported working 200 days or more off the farm. This is 15 percent of the total farm operators in the county. Also, as agricultural land is taken out of production, there would be a small decrease in the need for farm

labor. This would amount to about 2,000 hours annually during peak mining years.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

ENVIRONMENTAL CONSEQUENCES

CIRCLE WEST III TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 20,883 acres of tract lands is \$275,700 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$13.23 per acre. The value of all agricultural production for McCone County, in which this Circle West III tract is located, was \$21,040,000 in 1978 (Census of Agriculture—1978).

Farm—Ranch Operations

The tract contains 20,883 acres of farm land operated by 7 ranchers and farmers who also operate 71,284 acres of land outside the tract (Table 3 Circle West III, Site Specific Analysis). The average farm operation contains 13,167 acres of which 701 acres are small grains, 104 acres of hay, 11,991 acres of grazing land, and 371 acres of fallow and other.

On the basis of a representative farm classification, the 7 farms are classified as 1 small crop farm, 2 combination crop-livestock farms, 1 small livestock farm, 1 large livestock farm, and 2 extra large livestock farms. Available data shows no large crop farms within the tract.

Thirty-eight percent of the land within the tract was leased by 4 operators. Model farms used in the income analysis assume 38 percent leasing of all land operated.

The gross farm income for representative farms is \$33,000 (small crop), \$82,200 (crop-livestock), \$125,900 (small livestock), \$188,200 (large livestock), and \$326,000 (extra large livestock). The average for the 7 farms is \$166,700.

Net farm incomes are \$8,400, \$19,600, \$13,900, \$1,700, and \$30,100 respectively for the five farm types. The average for all farms is \$17,637 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farm assumes a 60 cow herd, the small livestock farm a 200 cow herd, the large livestock farm a 400 cow herd and the extra large livestock farm a 700 cow herd with cowcalf operations. On the livestock farms, about 59 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural production that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Circle West III tract is 36 years with a ten to fifteen year reclamation period. Based on a 15 year reclamation period, the peak mining period is 21 years. During the peak years, 42 percent of the tract acreage would be displaced from agricultural use. Some of the land would be involved in mining operations for 51 years.

On an average basis there would be 581 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$7,700. During the peak mining years 8,715 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$115,800 annually. This value represents about 0.55 percent of the value of McCone County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$24,400 annually. The present value of this loss over the life of the mine would be \$132,000. The present value of net agricultural income loss per million tons of coal mined would be \$285.

Farm—Ranch Operations

During the peak mining years, 8,715 acres would be out of production at some time and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year.

All of the operations have less than, or just over, 8,715 acres within the tract. Therefore, it is possible that each of these operators could have all or almost all of their land within the tract out of agricultural production at some point in the life of the mine. The consequences of this are shown on Table 1.

The operations fall in seven different categories. One of the most heavily impacted operations (a crop and livestock farm) has a loss in net income of about \$8.43 per acre. This loss in income is based on leasing 38 percent of all land operated. The present value in losing this income in perpetuity at 10 percent interest would be about \$85 per acre.

Overall, the loss in net income for all operators would average \$1.87 per acre. This loss would occur annually,

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
CIRCLE WEST III TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	1,320	33,000	8,400	1	3,000	0	5,900	0	7,700	0	11,500 ³
Large Cash Crop	3,860	98,700	25,300	0	9,200	0	19,000	0	28,600	0	36,400
Crop & Livestock	3,860	82,200	19,600	0	7,300	1	15,700	1	24,400	0	52,300
Small Livestock	7,200	125,900	13,900	1	5,700	0	13,200	0	23,000	0	32,400
Large Livestock	12,790	188,200	1,700	1	3,800	0	9,200	0	15,600	0	31,600
Extra Large Livestock	29,000	326,000	30,100	1	15,00	1	28,100	0	19,300	0	61,000

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

whereas coal is a one-time harvest. The present value of losing this income in perpetuity at 10 percent interest would be about \$19 per acre.

Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,300 per acre if grazing land is involved. This level of compensation would be over a period of time and would result from rental, bonus, royalty, and damage payments. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$10 per acre in the Circle West III tract.

Based on this analysis, it appears that a farm/ranch operator that leases 38 percent of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. On the average, about 77 percent of the land operated by the seven affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$1.87 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 7, Circle West III, Site Specific Analysis) mentions that sixteen known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ ranch operations and cost. Impacts to water quality or quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U. S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Coal development would compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry could provide. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 68 farm operators in McCone County reported working 200 days or more off the farm. This is 15 percent of the total farm operators in the county. Also, as agricultural land is taken out of production,

there would be a small decrease in the need for farm labor. This would amount to about 3,300 hours annually during peak mining years.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

REDWATER I TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 22,139 acres of tract lands is \$475,800 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$21.49 per acre. The value of all agricultural production for McCone County, in which this Redwater I tract is located, was \$21,040,000 in 1978 (Census of Agriculture—1978).

Farm—Ranch Operations

The tract contains 22,139 acres of farm land operated by 18 ranchers and farmers who also operate 92,403 acres of land outside the tract (Table 3 Redwater I, Site Specific Analysis). The average farm operation contains 6,363 acres of which 1,068 acres are small grains, 79 acres of hay, 4,461 acres of grazing land, and 775 acres of fallow and other.

On the basis of a representative farm classification, the 18 farms are classified as 5 small crop farms, 4 large crop farms, 4 combination croplivestock farms, 3 small livestock farms, 1 large livestock farm, and 1 extra large livestock farm.

Thirty percent of the land within the tract was leased by 10 operators. Four operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 38 percent leasing of all land operated.

The gross farm income for representative farms is \$33,000 (small crop), \$82,200 (crop-livestock), \$125,900 (small livestock), \$188,200 (large livestock), and \$326,000 (extra large livestock). The average for the 18 farms is \$98,900.

Net farm incomes are \$8,400, \$19,600, \$13,900, \$1,700, and \$30,100 respectively for the five farm types. The average for all farms is \$16,400 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farm assumes a 60 cow herd, the small livestock farm a 200 cow herd, the large livestock farm a 400 cow herd and the extra large livestock farm a 700 cow herd with cow-calf operations. On the livestock farms, about 59 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural production that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Redwater I tract is 33 years with a ten to fifteen year reclamation period. Based on a 15 year reclamation period, the peak mining period is 18 years. During the peak years, 45 percent of the tract acreage would be displaced from agricultural use. Some of the land would be involved in mining operations for 48 years.

On an average basis there would be 690 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$14,800. During the peak mining years 10,350 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$214,100 annually. This value represents about 1.02 percent of the value of McCone County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$75,000 annually. The present value of this loss over the life of the mine would be \$402,000. The present value of net agricultural income loss per million tons of coal mined would be \$865.

Farm—Ranch Operations

During the peak mining years, 10,350 acres would be out of production at any given time and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year.

All of the operations have less than 10,350 acres within the tract. Therefore, it is possible that each of these operators could have all of their land within the tract out of agricultural production at some point in the life of the mine. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations fall in the small cash crop class with 76 to 100 percent reduction in acreage. Loss in net income for the five model small cash crop operations is about \$8.71 per acre. This loss in income is based on leasing 38 percent of all land operated. The present value of losing this income in perpetuity at 10 percent interest would be about \$85 per acre.

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
REDWATER I TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	1,320	33,000	8,400	1	3,000	0	5,900	0	7,700	5	11,500 ³
Large Cash Crop	3,860	98,700	25,300	3	9,200	1	19,000	0	28,600	0	36,400
Crop & Livestock	3,860	82,200	19,600	2	7,300	0	15,700	0	24,400	2	52,300
Small Livestock	7,200	125,900	13,900	2	5,700	0	13,200	0	23,000	1	32,400
Large Livestock	12,790	188,200	1,700	1	3,800	0	9,200	0	15,600	0	31,600
Extra Large Livestock	29,000	326,000	30,100	1	15,00	0	28,100	0	19,300	0	61,000

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

Overall, the loss in net income for all operators would average \$7.25 per acre annually. This loss would occur annually, whereas coal is a one-time harvest. The present value of losing this income in perpetuity at 10 percent interest would be \$75.00 per acre.

Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,300 per acre if grazing is involved. This compensation would occur over a period of time and would result from rental, bonus, royalty and damage payments. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$465 per acre in the Redwater I tract.

Based on this analysis, it appears that a farm/ranch operator that leases 38 percent of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. On the average, about 80 percent of the land operated by the six affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the average of \$7.25 per acre annually. Lost income would be the profit that is now being realized from the lease after the rent is paid. One operation appears to be totally under lease in the tract and would be totally removed from production during the peak mining years.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 10, Redwater I, Site Specific Analysis) mentions that 22 known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality or quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U. S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as

theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Coal development would compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry could provide. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 68 farm operators in McCone County reported working 200 days or more off the farm. This is

15 percent of the total farm operators in the county. Also, as agricultural land is taken out of production, there would be a small decrease in the need for farm labor. This would amount to about 5,300 hours annually during peak mining years.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in agricultural economic analysis.

REDWATER II TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 20,246 acres of tract lands is \$304,000 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$15.02 per acre. The value of all agricultural production for McCone and Dawson Counties, in which this Redwater II tract is located, was \$42,484,000 in 1978 (Census of Agriculture—1978).

Farm—Ranch Operations

The tract contains 20,246 acres of farm land operated by 13 ranchers and farmers who also operate 38,632 acres of land outside the tract (Table 3 Redwater II, Site Specific Analysis). The average farm operation contains 4,529 acres of which 1,242 acres are small grains, 63 acres of hay, 2,101 acres of grazing land, and 1,123 acres of fallow and other.

On the basis of a representative farm classification, the 13 farms are classified as 4 small crop farms, 4 large cash crop farms, 3 combination crop-livestock farms, and 2 small livestock farms. Available data shows no large livestock or extra large farms within the tract.

Fifty percent of the land within the tract was leased by 7 operators. Four operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 38 percent leasing of all land operated.

The gross farm income for representative farms is \$33,000 (small crop), \$98,700 (large crop), \$82,200 (crop-livestock), and \$125,900 (small livestock). The average for the 13 farms is \$78,900.

Net farm incomes are \$8,400, \$25,300, \$19,600, and \$13,900 respectively for the four farm types. The average for all farms is \$17,000 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farm assumes a 60 cow herd, and the small livestock farm a 200 cow herd with cow-calf operations. On the livestock farms, about 59 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural production that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Redwater II tract is 40 years with a ten to fifteen year reclamation period. Based on a 15 year reclamation period, the peak mining period is 25 years. During the peak years, 38 percent of the tract acreage would be displaced from agricultural use. Some of the land would be involved in mining operations for 55 years.

On an average basis there would be 506 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$7,600. During the peak mining years 7,590 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$113,900 annually. This value represents about .27 percent of the value of McCone and Dawson Counties' annual agricultural production.

Loss in net agricultural income (value) during peak mining would be \$34,800 annually. The present value of this loss over the life of the mine would be \$190,200. The present value of net agricultural income loss per million tons of coal mined would be \$665.

Farm—Ranch Operations

During the peak mining years, 7,590 acres would be out of production at a given time and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year.

All of the operations have less than 7,590 acres within the tract. Therefore, it is possible that each of these operators could have all of their land within the tract out of agricultural production at some point in the life of the mine. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (4) fall in the large cash crop class with a minor amount to 25 percent reduction in acreage. Loss in net income for the four model large cash crop operations is about \$9.53 per acre. This loss in income is based on leasing 38 percent of all land operated. The present value of losing this income in perpetuity at 10 percent interest would be \$95.00 per acre.

Overall, the loss in net income for all operators would average \$4.58 per acre. This loss would occur annually,

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
REDWATER II TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	1,320	33,000	8,400	3	3,000	0	5,900	0	7,700	1	11,500 ³
Large Cash Crop	3,860	98,700	25,300	4	9,200	0	19,000	0	28,600	0	36,400
Crop & Livestock	3,860	82,200	19,600	0	7,300	1	15,700	1	24,400	1	52,300
Small Livestock	7,200	125,900	13,900	1	5,700	0	13,200	1	23,000	0	32,400
Large Livestock	12,790	188,200	1,700	0	3,800	0	9,200	0	15,600	0	31,600
Extra Large Livestock	29,000	326,000	30,100	0	15,00	0	28,100	0	19,300	0	61,000

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

whereas coal is a one-time harvest. The present value of losing this income in perpetuity at 10 percent interest would be about \$45 per acre.

Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,300 per acre if grazing land is involved. This compensation would occur over a period of time and would result from rental, bonus, royalty and damage payments. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$300 per acre in the Redwater II tract.

Based on this analysis, it appears that a farm/ranch operator that leases 38 percent of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. On the average, about 66 percent of the land operated by the six affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the average \$4.58 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid. Two of the operators have 85 to 95 percent of their operations under lease in the tract and would be totally removed from production during the peak mining years.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 10, Redwater II, Site Specific Analysis) mentions that ten known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality or quantity would be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U. S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern

is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Coal development could compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry could provide. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 167 farm operators in McCone and Dawson Counties reported working 200 days or more

off the farm. This is 17 percent of the total farm operators in the county. Also, as agricultural land is taken out of production, there would be a small decrease in the need for farm labor. This would amount to about 3,300 hours annually during peak mining years.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

SOUTHWEST GLENDIVE TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 21,307 acres of tract lands is \$386,600 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$18.14 per acre. The value of all agricultural production for Dawson County, in which this Southwest Glendive tract is located, was \$21,444,000 in 1978 (Census of Agriculture—1978).

Farm—Ranch Operations

The tract contains 21,307 acres of farm land operated by 17 ranchers and farmers who also operate 54,773 acres of land outside the tract (Table 3, Southwest Glendive, Site Specific Analysis). The average farm operation contains 4,473 acres of which 616 acres are small grains, 220 acres of hay, 3,069 acres of grazing land, and 568 acres of fallow and other.

On the basis of a representative farm classification, the 17 farms are classified as 4 small crop farms, 12 combination crop-livestock farms, and 1 small livestock farm. Available data shows no large crop or large livestock farms within the tract.

Thirty-two percent of the land within the tract was leased by 9 operators. Representative farms used in the income analysis assume 38 percent leasing of all land operated.

The gross farm income for representative farms is \$33,000 (small crop), \$82,200 (crop-livestock), and \$125,900 (small livestock). The average for the 17 farms is \$73,200.

Net farm incomes are \$8,400, \$19,600, and \$13,900 respectively for the three farm types. The average for all farms is \$16,700 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farm assumes a 60 cow herd and the small livestock farm a 200 cow herd with cow-calf operations. On the livestock farms, about 59 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural pro-

duction that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Southwest Glendive tract is 30 years with a ten to fifteen year reclamation period. Based on a 15 year reclamation period, the peak mining period is 15 years. During the peak years, 50 percent of the tract acreage would be displaced from agricultural use. Some of the land would be involved in mining operations for 45 years.

On an average basis there would be 709 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$12,750. During the peak mining years 10,635 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$191,300 annually. This value represents about 0.89 percent of the value of Dawson County's annual agricultural production.

Loss in net agricultural income (value) during peak mining would be \$75,900 annually. The present value of this loss over the life of the mine at 10 percent interest would be \$401,300. The present value of net agricultural income (value) loss per million tons of coal mined would be \$965.

Farm—Ranch Operations

During the peak mining years, 10,635 acres would be out of production at a given time and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year.

All of the operations have less than 10,635 acres within the tract. Therefore, it is possible that each of these operators could have all of their land within the tract out of agricultural production at some point in the life of the mine. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (6) fall in the crop-livestock class with 26 to 50 percent reduction in acreage. Loss in net income for the six model crop and livestock operations is about \$8.13 per acre. This loss in income is based on leasing 38 percent of all land operated. The present value of losing this income in perpetuity at 10 percent interest would be about \$80 per acre.

Overall, the loss in net income for all operators would average \$7.14 per acre annually. This loss would occur annually, whereas coal is a onetime harvest. The present value of losing this income in perpetuity at 10 percent interest would be about \$70 per acre.

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
SOUTHWEST GLENDIVE TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	1,320	33,000	8,400	2	3,000	1	5,900	1	7,700	0	11,500 ³
Large Cash Crop	3,860	98,700	25,300	0	9,200	0	19,000	0	28,600	0	36,400
Crop & Livestock	3,860	82,200	19,600	2	7,300	6	15,700	3	24,400	1	52,300
Small Livestock	7,200	125,900	13,900	1	5,700	0	13,200	0	23,000	0	32,400
Large Livestock	12,790	188,200	1,700	0	3,800	0	9,200	0	15,600	0	31,600
Extra Large Livestock	29,000	326,000	30,100	0	15,00	0	28,100	0	19,300	0	61,000

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,300 per acre if grazing land is involved. This compensation would occur over a period of time and would result from rental, bonus, royalty and damage payments. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$460 per acre in the Southwest Glendive tract.

Based on this analysis, it appears that a farm/ranch operator that leases 38 percent of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. On the average, about 72 percent of the land operated by the 17 affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the average \$7.14

per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace.

The hydrology section (page 17, Southwest Glendive, Site Specific Analysis) mentions that 26 known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality or quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U. S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Coal development would compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry could provide. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 99 farm operators in Dawson County reported working 200 days or more off the farm. This is 18 percent of the total farm operators in the county. Also, as agricultural land is taken out of production,

there would be a small decrease in the need for farm labor. This would amount to about 5,400 hours annually during peak mining years.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

NORTH WIBAUX-BEACH TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 19,768 acres of tract lands is \$748,400 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$37.86 per acre. The value of all agricultural production for Wibaux and Golden Valley Counties, in which this North Wibaux-Beach tract is located, was \$23,438,000 in 1978.

Farm—Ranch Operations

The tract contains 19,768 acres of farm land operated by 34 ranchers and farmers who also operate 56,070 acres of land outside the tract (Table 6, North Wibaux-Beach Site Specific Analysis). The average farm operation contains 2,231 acres of which 1,280 acres are hay and grain, 509 acres pasture, and 442 acres fallow.

On the basis of a representative farm classification, the 34 farms are classified as 12 small crop farms, 14 large crop farms, and 8 combination crop-livestock farms. Available data shows no large livestock operations involved with tract lands.

Sixty-one percent of the land within the tract was leased by 23 operators. Ten operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm incomes for representative farms are \$41,500 (small crop), \$94,500 (large crop) and \$52,500 (crop-livestock). The average for the 34 North Wibaux-Beach farms is \$65,900. Net farm incomes are \$12,100, \$19,600, and \$10,900 respectively for the three farm types. The average for all farms is \$14,900 per farm. Current farm operating expenses are \$51,000 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farms assume a 60 cow base herd with cow-calf operation. On this type of farm, about 36 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural production that would be displaced if coal were mined.

Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the North Wibaux-Beach tract is 40 years with a 10-year reclamation period. The peak year mining period is 30 years. The peak years would involve 25 percent of the tract acreage. Some of the land would be involved in mining operations for 50 years.

On an average basis there would be 500 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$18,700. During the peak mining years 5,000 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$187,000 annually. This value would be about .8 percent of the value of Wibaux and Golden Valley Counties' annual agricultural production.

Loss in net agricultural income (value) during peak mining would be \$60,200 annually. The present value of this loss over the life of the mine at 10 percent interest would be \$398,700. The present value of net agricultural income loss per million tons of coal mined would be \$720.

Farm—Ranch Operations

During the peak mining years with the 5,000 acres out of production, the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since no operation has over 5,000 acres within the tract, it is possible that each operation during the life of the mine could have all of its land within the tract out of production. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (8) fall in the crop and livestock class with a potential reduction in size of a very minor amount up to 25 percent. Farm/ranch net income in this class could be reduced by about \$3,800 or 35 percent of present net income with a 25 percent proportional reduction in acreage owned and leased. As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income of about \$8.00 per acre. The present value of losing this income in perpetuity at 10 percent interest would be \$80.00 per acre.

Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements,

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
NORTH WIBAUX-BEACH TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	2	3,900	3	8,000	3	12,200	4	15,700 ³
Large Cash Crop	1,895	94,500	19,600	6	7,200	3	15,400	5	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	8	3,800	0	8,200	0	12,900	0	17,000
Small Livestock	4,490	91,900	8,800	0	2,700	0	7,100	0	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

livestock water supplies and distribution, and in general disrupt the overall operation.

Overall reduction in net income averages \$12.04 per acre for all operators in the tract.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$600 per acre in the North Wibaux-Bench tract.

Based on this analysis it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. Approximately 74 percent of the land operated by the 34 affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$8.00 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid. Two of the small crop operators have all of their operations under lease in the tract and would be totally removed from production during the peak mining years. Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on

these operators, though, are much more difficult to trace. The hydrology section (page 13, North Wibaux-Beach Site Specific Analysis) mentions that about 63 known wells in and outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis.

SOUTH WILSON BEACH TRACT

In 1978, a total of 81 farm operators in Wibaux and Golden Valley Counties reported working 200 days or more off the farm. This is 15 percent of the total farm operators in the county. Also, as agricultural land is taken out of production, there would be a small decrease in the need for farm labor. This would amount to about 7,500 hours annually during peak mining years.

Impacts on directly affected farmers and ranchers

would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

SOUTH WIBAUX-BEACH TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 15,094 acres of tract lands is \$520,000 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$34.44 per acre. The value of all agricultural production for Wibaux and Golden Valley Counties, in which this South Wibaux-Beach tract is located, was \$23,438,000 in 1978.

Farm—Ranch Operations

The tract contains 15,094 acres of farm land operated by 36 ranchers and farmers who also operate 75,336 acres of land outside the tract (Table 6, South Wibaux-Beach Site Specific Analysis). The average farm operation contains 2,548 acres of which 1,395 acres are hay and grain, 568 acres pasture, 549 acres fallow, and 36 acres other.

On the basis of a representative farm classification, the 36 farms are classified as 18 small crop farms, 10 large crop farms, and 7 combination crop-livestock farms and 1 small livestock farm. Available data shows no large livestock operations involved with tract lands.

Sixty-one percent of the land within the tract was leased by 26 operators. Twenty operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm incomes for representative farms are \$41,500 (small crop), \$94,500 (large crop) and \$52,500 (crop-livestock). The average for the 36 South Wibaux-Beach farms is \$59,800. Net farm incomes are \$12,100, \$19,600, \$10,900 and \$8,800 respectively for the four farm types. The average for all farms is \$13,800 per farm. Current farm operating expenses are \$46,000 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farms assume a 60 cow base herd with cow-calf operation. On this type of farm, about 36 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural pro-

duction that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the South Wibaux-Beach tract is 42 years with a 10-year reclamation period. The peak year mining period is 32 years. The peak years would involve 23 percent of the tract acreage. Some of the land would be involved in mining operations for 57 years.

On an average basis there would be 360 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$12,000. During the peak mining years 3,600 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$120,000 annually. This value would be about .51 percent of the value of Wibaux and Golden Valley Counties' annual agricultural production.

Loss in net agricultural income (value) during peak mining would be \$39,900 annually. The present value of the loss over the life of the mine at 10 percent interest would be \$269,000. The present value of net agricultural income loss per million tons of coal mined would be \$450.

Farm—Ranch Operations

During the peak mining years with the 3,600 acres out of production, the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since no operation has over 3,600 acres within the tract, it is possible that each operation during the life of the mine could have all of its land within the tract out of production. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (12) fall in the small cash grain class with a potential reduction in size of a very minor amount up to 25 percent. Farm/ranch net income in this class could be reduced by about \$3,900 or 32 percent of present net income with a 25 percent proportional reduction in acreage owned and leased. As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income of about \$18.57 per acre. The present value of losing this income in perpetuity at 10 percent interest would be \$185 per acre.

The second largest group of operations impacted fall in the crop-livestock with a minor to 25 percent reduction in acreage. Impact of strip mining on the operation and management of livestock ranches could be more

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
SOUTH WIBAUX—BEACH TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	12	3,900	1	8,000	2	12,200	3	15,700 ³
Large Cash Crop	1,895	94,500	19,600	6	7,200	2	15,400	2	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	7	3,800	0	8,200	0	12,900	0	17,000
Small Livestock	4,490	91,900	8,800	1	2,700	0	7,100	0	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Three operations fall in the small cash crop, 76 to 100 percent reduction in acreage. These would be most severely impacted. Overall reduction in net income averages \$11.08 per acre for all operators in the tract. Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$870 per acre in the South Wibaux-Beach tract.

Based on this analysis it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. Approximately 83 percent of the land operated by the 36 affected farmers/ ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$18.57 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid. This amounts to about \$10 per acre annually for the small crop farm.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general

area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 13, South Wibaux-Beach Site Specific Analysis) mentions that about 77 known wells in and outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 81 farm operators in Wibaux and

Golden Valley Counties reported working 200 days or more off the farm. This is 15 percent of the total farm operators in the county. Also, as agricultural land is taken out of production, there would be a small decrease in the need for farm labor. This would amount to about 5,000 hours annually during peak mining years.

Impacts on directly affected farmers and ranchers

would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

ZENITH TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 22,508 acres of tract lands is \$947,300 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$42.08 per acre. The value of all agricultural production for Stark County, in which this Zenith tract is located, was \$30,716,000 in 1978.

Farm—Ranch Operations

The tract contains 22,508 acres of farm land operated by 36 ranchers and farmers who also operate 28,725 acres of land outside the tract (Table 5, Zenith Site Specific Analysis). The average farm operation contains 1,423 acres of which 695 acres are hay and grain, 430 acres pasture, 298 acres fallow and other.

On the basis of a representative farm classification, the 36 farms are classified as 25 small crop farms, 7 large crop farms, and 4 combination crop-livestock farms. Available data shows no small livestock operations involved with tract lands.

Forty-five percent of the land within the tract was leased by 18 operators. Eleven operators leased all the land operated by them in the tract.

Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm incomes for representative farms are \$41,500 (small crop), \$94,500 (large crop) and \$52,500 (crop-livestock). The average for the 36 Stark farms is \$53,100. Net farm incomes are \$12,100, \$19,600, and \$10,900 respectively for the three farm types. The average for all farms is \$13,400 per farm. Current farm operating expenses are \$39,700 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farms assume a 60 cow base herd with cow-calf operation. On this type of farm, about 36 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural pro-

duction that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Zenith tract is 40 years with a 10-year reclamation period. The peak year mining period is 30 years. The peak years would involve 25 percent of the tract acreage. Some of the land would be involved in mining operations for 50 years.

On an average basis there would be 560 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$23,680. During the peak mining years 5,600 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$236,800 annually. This value would be about .77 percent of the value of Stark County's annual agricultural production.

Loss in net agricultural income (value) during peak mining would be \$82,400 annually. The present value of this loss over the life of the mine would be \$545,700. The present value of net agricultural income loss per million tons of coal mined would be \$1,120.

Farm—Ranch Operations

During the peak mining years that the 5,600 acres would be out of production, the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since no operation has over 5,600 acres within the tract, it is possible that each operation at some point in the life of the mine could have all of its land within the tract out of production. The consequences of this are shown on Table 1.

The largest number of operations (11) fall in the small cash crop class with 76 to 100 percent reduction in acreage. These operations would be severely impacted with some being completely eliminated.

The second largest number of operations (7) fall in the small cash grain class with a potential reduction in size of a very minor amount up to 25 percent. Farm/ranch net income in this class could be reduced by about \$3,900 or 32 percent of present net income with a 25 percent proportional reduction in acreage owned and leased. As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income of about \$18.57 per acre. The present value of losing this income in perpetuity at 10 percent interest would be about \$185 per acre.

Overall reduction in net income averages \$14.71 per acre for all operations in the tract. Impact of strip mining

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
ZENITH TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	7	3,900	3	8,000	4	12,200	11	15,700 ³
Large Cash Crop	1,895	94,500	19,600	4	7,200	1	15,400	1	24,000	1	31,900
Crop & Livestock	1,900	52,500	10,900	2	3,800	2	8,200	0	12,900	0	17,000
Small Livestock	4,490	91,900	8,800	0	2,700	0	7,100	0	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$560 per acre in the Zenith tract.

Based on this analysis it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated up to eight times as much as he or she might lose in agricultural income, even assuming no reclamation. Approximately 56 percent of the land operated by the 36 affected farmers/ ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$18.57 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid. This amounts to about \$10 per acre annually for the small crop farm. One operator has all of his operation under lease in the tract and would be totally removed from production during the peak mining years. Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on

these operators, though, are much more difficult to trace. The hydrology section (page 29, Zenith Site Specific Analysis) mentions that between 15 and 50 known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 124 farm operators in Stark County reported working 200 days or more off the farm. This is 15 percent of the total farm operators in the county.

Also, as agricultural land is taken out of production, there would be a small decrease in the need for farm labor. This would amount to about 8,600 hours annually during peak mining years.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available

to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

SCHOOLHOUSE TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 12,949 acres of tract lands is \$479,300 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$37.01 per acre. The value of all agricultural production for Oliver County, in which this Schoolhouse tract is located, was \$12,579,000 in 1978.

Farm—Ranch Operations

The tract contains 12,949 acres of farm land operated by 27 ranchers and farmers who also operate 31,314 acres of land outside the tract (Table 5, Schoolhouse Site Specific Analysis). The average farm operation contains 1,639 acres of which 537 acres are hay and grain, 922 acres pasture, 150 acres fallow, and 30 acres other.

On the basis of a representative farm classification, the 27 farms are classified as 19 small crop farms, one large crop farm, 5 combination crop-livestock farms, and two small livestock farms. Available data shows no large livestock operations involved with tract lands.

Sixty-two percent of the land within the tract was leased by 26 operators. Twelve operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm incomes for representative farms are \$41,500 (small crop), \$94,500 (large crop) and \$52,500 (crop-livestock) and \$8,800 (small livestock). The average for the 37 Schoolhouse farms is \$49,300. Net farm incomes are \$12,100, \$19,600, \$10,900 and \$8,800 respectively for the four farm types. The average for all farms is \$11,900 per farm. Current farm operating expenses are \$37,400 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farms assume a 60 cow base herd with cow-calf operation. On this type of farm, about 36 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural pro-

duction that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Schoolhouse tract is 48 years with a 10-year reclamation period. The peak year mining period is 38 years. The peak years would involve 21 percent of the tract acreage. Some of the land would be involved in mining operations for 58 years.

On an average basis there would be 270 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$10,070. During the peak mining years 2,700 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$100,700 annually. This value would be about .80 percent of the value of Oliver County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$35,200 annually. The present value of the loss over the life of the mine at 10 percent interest would be \$235,700. The present value of net agricultural income loss per million tons of coal mined would be \$950.

Farm—Ranch Operations

During the peak mining years 2,700 acres would be out of production and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since no operation has over 2,700 acres within the tract, it is possible that each operation during the life of the mine could have all of its land within the tract out of production. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (9) fall in the small cash grain class with a potential reduction in size of a very minor amount up to 25 percent. Farm/ranch net income in this class could be reduced by about \$3,900 or 32 percent of present net income with a 25 percent proportional reduction in acreage owned and leased. As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income of about \$18.57 per acre. The present value of losing this income in perpetuity at 10 percent interest would be \$185.70 per acre.

Six operations would be severely impacted with 76 to 100 percent of their operation displaced at some point in the mining process. Overall reduction in net income averages \$13.03 per acre for all operators in the tract. Impact of strip mining on the operation and management of livestock ranches could be more severe than

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
SCHOOLHOUSE TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	9	3,900	2	8,000	2	12,200	6	15,700 ³
Large Cash Crop	1,895	94,500	19,600	0	7,200	0	15,400	1	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	4	3,800	0	8,200	1	12,900	0	17,000
Small Livestock	4,490	91,900	8,800	2	2,700	0	7,100	0	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$455 per acre in the Schoolhouse tract. Based on this analysis it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated up to eight times as much as he or she might lose in agricultural income, even assuming no reclamation. Approximately 71 percent of the land operated by the 27 affected farmers/ ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$18.57 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid. This amounts to about \$10 per acre annually for the small crop farm. Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 24, Schoolhouse Site Specific Analysis) mentions that 15 rural water users related to the tract could experience

water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 75 farm operators in Oliver County reported working 200 days or more off the farm. This is 19 percent of the total farm operators in the county.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

UNDERWOOD TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

This assessment covers agricultural land in those farm/ranch operations which have some part of their land within the tract over federal coal. The present value of agricultural production on the 6,057 acres of tract lands is \$270,400 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$44.64 per acre. The value of all agricultural production for McLean County, in which this Underwood tract is located, was \$39,585,000 in 1978.

Farm—Ranch Operations

There are 6,057 acres of farm land within the tract which are operated by 10 ranchers and farmers who have some part of their land over federal coal. They also operate 9,982 acres of land outside the tract (Table 4, Underwood Site Specific Analysis). The average farm operation contains 1,572 acres of which 774 acres are hay and grain, 309 acres pasture, and 489 acres fallow.

On the basis of a representative farm classification, the 10 farms are classified as 5 small crop farms, and 5 large crop farms. Available data shows no livestock operations involved with tract lands.

Fifty-one percent of the land within the tract was leased by 7 operators. Three operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm incomes for representative farms are \$41,500 (small crop), and \$94,500 (large crop). The average for the 10 Underwood farms is \$68,000. Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. Net farm incomes are \$12,100 and \$10,900 respectively for the two farm types. The average for all farms is \$11,500 per farm. Current farm operating expenses are \$56,500 per farm. These incomes are available for family labor and return on investment.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural production that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Underwood tract is 52 years with a 10-year reclamation period. The peak year mining period is 42 years. The peak years would involve 19 percent of the tract acreage. Some of the land would be involved in mining operations for 62 years.

On an average basis there would be 116 acres of the land under consideration removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$6,760. During the peak mining years 1,160 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$67,600 annually. This value would be about 0.17 percent of the value of McLean County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$18,200 annually. The present value of this loss over the life of the mine would be \$122,200. The present value of net agricultural income loss per million tons of coal mined would be \$1,700.

Farm—Ranch Operations

During the peak mining years that the 1,160 acres would be out of production, the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since no operation has over 1,160 acres within the tract, it is possible that each operation during some point in the life of the mine could have all of its land within the tract out of production. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (3) fall in the large cash grain class with a potential reduction in size of a very minor amount up to 25 percent. Farm/ranch net income in this class could be reduced by about \$7,200 or 37 percent of present net income with a 25 percent proportional reduction in acreage owned and leased. As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income of about \$15.16 per acre. The present value of losing this income in perpetuity at 10 percent interest would be about \$150 per acre.

Overall reduction in net income averages \$15.67 per acre for all operations under consideration in this tract. Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
UNDERWOOD TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	1	3,900	1	8,000	1	12,200	2	15,700 ³
Large Cash Crop	1,895	94,500	19,600	3	7,200	1	15,400	1	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	0	3,800	0	8,200	0	12,900	0	17,000
Small Livestock	4,490	91,900	8,800	0	2,700	0	7,100	0	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$260 per acre in the Underwood tract.

Based on this analysis it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated up to many times more than he or she might lose in agricultural income, even assuming no reclamation. Approximately 64 percent of the land operated by the 10 affected farmers/ ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract. Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$15.16 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. Wells outside the tract boundaries could experience water level lowering. There is also a potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect

farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 188 farm operators in McLean County reported working 200 days or more off the farm. This is 16 percent of the total farm operators in the county.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

NORTH BEULAH TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

The present value of agricultural production on the 3,495 acres of tract lands is \$74,400 annually. This comes from small grains, hay, pasture, and livestock. The value of agricultural production per acre in the tract averages \$21.29. This tract is located in Mercer County which had a total value of agricultural production of \$16,954,000 in 1978.

Farm—Ranch Operations

The tract contains 3,495 acres of farm land operated by 7 ranchers and farmers who also operate 12,071 acres of land outside the tract. (Table 4, North Beulah Site Specific Analysis.) The average farm operation contains 2,224 acres of which 487 acres are small grains, 182 acres of hay, 1,282 acres of pasture and 273 acres of fallow and other.

On the basis of a representative farm classification, the 7 farms are classified as 3 small crop farms and 4 combination crop-livestock farms. Available data shows no large livestock or large crop farms within the tract.

Fifty-one percent of the land within the tract was leased by 4 operators. One operator leased all the land that he operated in the tract. Representative farms used in the income analysis assume 52 percent leasing of all land operated. The gross farm income for representative farms are \$41,500 (small crop) and \$52,500 (crop-livestock). The average for the farms is \$47,800.

Net farm incomes are \$12,100 and \$10,900 respectively for the two farm types. The average for all farms is \$11,400 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms so gross farm income is entirely from sale of crops. The crop-livestock farms assume a 60 cow herd with cow-calf operations. On the livestock farms, about 36 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

A concern frequently expressed is the amount of agricultural production that would be displaced with strip mining. The significance of this potential loss can best be expressed by comparing the value lost with the county total.¹

The mining period for the North Beulah tract is 40 years with a 10-year reclamation period. The peak year mining period is 30 years. The peak year would involve 25 percent of the tract acreage. Some of the land would be involved in mining operations for 50 years.

On an average basis there would be 87 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$1,860.

During the peak mining years, 870 acres of land would be removed from agriculture and the value of production would be reduced by \$18,600 annually. This reduction would be about .11 percent of value of Mercer County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$6,000 annually. The present value of this loss over the life of the mine at 10 percent interest would be \$39,700. The present value of net agricultural income loss per million tons of coal mined would be \$915.

Farm—Ranch Operations

The impact of coal mining on individual farm/ranch operations would vary considerably (see Table 1). During peak mining years, 870 acres would be out of agricultural production and conceivably each of the seven farm/ranch operations could have all of their land within the tract affected at some point in time. This is because no operation has more than 870 acres within the tract.

As shown on Table 1, five of the seven operations would have less than 25 percent of their operations affected. The largest number of farm/ranch operations (3) fall in the crop and livestock class with a minor to 25 percent reduction in acreage. In this class, a 25 percent reduction in acreage would result in reduced income of about \$3,800. This is based on leasing 52 percent of the land and reducing the leased and owned land by a proportional amount. This results in a reduced income of about \$7.70 per acre. The present value of losing this stream of income in perpetuity at 10 percent interest would be \$77.00 per acre. This assessment is based on losing the various types of land in the same proportion that they exist in the model crop-livestock farm. The impact would be greater, for example, if all of an operator's hay base were lost. Overall, the reduction in net income for all operations in the tract would average \$6.86 per acre annually.

Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements,

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
NORTH BEULAH TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	2	3,900	1	8,000	0	12,200	0	15,700 ³
Large Cash Crop	1,895	94,500	19,600	0	7,200	0	15,400	0	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	3	3,800	1	8,200	0	12,900	0	17,000
Small Livestock	4,490	91,900	8,800	0	2,700	0	7,100	0	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

livestock water supplies and distribution, and in general disrupt the overall operation. Compensation to the farm/ranch operator would depend upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased.

The operator that only leases land within the tract would not be compensated. Lost income per acre is estimated at \$5.35 for the crop-livestock farm model if it involves losing leased land.

There are a number of different types of landowner lease agreements. Some of the new agreements could result in paying the landowner up to \$1,500 per acre if the land involved is dry land crop. Some of the older agreements were for \$1 per acre with 2¢ per ton royalty rate. In the North Beulah tract this type of agreement would result in the landowner receiving about \$360 per acre. It appears that a landowner, even at a minimum, would be more than compensated for any loss in agricultural income.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 21, North Beulah Site Specific Analysis) mentions that there are no known wells outside the tract boundaries that could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might

affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Development of coal mines would compete directly with agriculture for labor resources. This could increase the cost of labor to area farmers and ranchers.

At the same time, operators of small farms may take advantage of the new off-farm job opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978 a total of 532 farm operators in Mercer County reported working 200 days or more off the farm. This is 20 percent of the total farm operators in the county.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

The technical report is available which discusses the methodology used in the agricultural economic analysis.

RENNER TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

The present value of agricultural production on the 22,072 acres of tract lands is \$848,000 annually. This total involves primarily small grain, hay, pasture, and livestock production. The average value of agricultural production per acre in the tract is \$38.42. The Renner tract is located in Mercer County. This county's value of agricultural production in 1978 was \$16,954,000.

Farm—Ranch Operations

The tract contains 22,072 acres of farm land operated by 40 ranchers and farmers who also operate 33,902 acres of land outside the tract (Table 5 Renner Site Specific Analysis). The average farm operation contains 1,399 acres of which 336 acres are small grains, 118 acres hay, 829 acres of pasture and 116 acres of fallow and other.

On the basis of a representative farm classification, the 40 farms are classified as 26 small crop farms, 12 combination crop-livestock farms, and 2 small livestock farms. Available data shows no large livestock or large crop farms within the tract.

Twenty-nine percent of the land within the tract was leased by 26 operators. Fifteen operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 52 percent leasing of all land operated.

The gross farm income for representative farms are \$41,500 (small crop), \$52,500 (crop-livestock), and \$92,000 (small livestock). The average for the Renner farms is \$47,300.

Net farm incomes are \$12,100, \$10,900, and \$8,800 respectively for the three farm types. The average for all farms is \$11,500 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms so gross farm income is entirely from sale of crops. The crop-livestock farms assume a 60 cow herd and the small livestock farms a 200 cow herd with cow-calf operations. On the livestock farms, about 43 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Strip mining of coal would displace agricultural produc-

tion. There is concern over the significance of this displaced production. Expressing such losses in dollar terms and comparing it with the total for Mercer County places the issue in perspective.¹

The mining period for the Renner tract is 45 years with a 10-year reclamation period. The peak year mining period is 35 years. During the peak year, 22 percent of the tract acreage would be displaced from agricultural use. Some of the land would be involved in mining operations for 55 years.

On an average basis there will be 490 acres of land removed from production each year during the development period which will result in an annual reduction in the value of agricultural production of \$18,060. During the peak mining years 4,900 acres of land will be removed from farms and gross agricultural income will be reduced by \$180,600 annually. This value would be one percent of the value of Mercer County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$61,400 annually. The present value of this loss over the life of the mine at 10 percent interest would be \$409,800. The present value of the net agricultural income loss per million tons of coal mined would be \$1,000.

Farm—Ranch Operations

Table 11 shows by farm/ranch class and percentage of farm/ranch acreage, the number of operations that could be affected during peak mining years. No operator has over 4,900 acres within the tract. Therefore, it is entirely possible that each operator could have all of his or her land within the tract out of production during the peak mining years.

As shown on Table 1, the largest number of operations (14) fall in the small cash crop class with 76 to 100 percent reduction in acreage. Within this class net farm income would be reduced by about \$15,700 for 100 percent reduction in acreage. This is about \$3,700 more than present income because it is assumed that the operator would maintain his or her machinery and equipment until farming could start again. The loss in income per acre would average \$18.72 based on leasing 52 percent of the land. The present value of losing this stream of income in perpetuity at 10 percent interest would be about \$187.00 per acre.

Most of the 15 operators that lease all the land they have in the tract are in the small cash crop class. It is estimated that they would lose about \$11 per acre in net farm income if they were to lose their leases.

The overall average loss in net income for all operators involved with the tract would be \$12.53 per acre.

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
RENNER TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	5	3,900	6	8,000	1	12,200	14	15,700 ³
Large Cash Crop	1,895	94,500	19,600	0	7,200	0	15,400	0	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	5	3,800	5	8,200	1	12,900	1	17,000
Small Livestock	4,490	91,900	8,800	1	2,700	1	7,100	0	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

Impact on strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

In those instances where the operator owns the land affected, income losses would be more than mitigated. Even where the land is strictly grazing land, landowners could receive up to \$1,300 per acre under the terms of many recent leases. Many old leases were for \$1 per acre rental with a 2¢ per ton royalty when the coal is mined. Under these terms, an owner in the Renner tract would receive about \$500 per acre compensation.

For those operators losing leased land, there appears to be little mitigation available. Department of Agriculture programs are available to assist these individuals as they are available to all farmers. The Bureau of Land Management, though, has no programs available that can mitigate these impacts.

The impact of farmers and ranchers in the area with respect to the labor issue can be both positive and negative.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 28, Renner Site Specific Analysis) mentions that between 25 to 75 known wells in and outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in

water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Coal mines can increase the competition for labor resources and possibly drive up the wage rate. At the same time, though, during the peak mining period, operator and family farm labor would be reduced about 5,000 hours annually for the tract. Hired farm labor would be reduced about 2,600 hours annually.

In Mercer County 109, or 20 percent of the farm operators, reported working 200 or more days off the farm. Coal mining could provide additional off-farm employment and assist those operators that are presently under-employed on their farms.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

ANTELOPE TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

This assessment covers agricultural land in those farm/ranch operations which have some part of their land within the tract over federal coal. Presently the value of agricultural production on these 3,720 acres of tract lands is \$163,400 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$43.92 per acre. The value of all agricultural production for Mercer County, in which this Antelope tract is located, was \$16,954,000 in 1978.

Farm—Ranch Operations

There are 3,720 acres of farm land operated by 7 ranchers and farmers who have some part of their land over federal coal. They also operate 10,232 acres of land outside the tract (Table 4, Antelope Site Specific Analysis). The average farm operation contains 1,993 acres of which 685 acres are hay and grain, 1,149 acres pasture, and 159 acres fallow.

On the basis of a representative farm classification, the 7 farms are classified as 3 small crop farms, 3 combination crop-livestock farms, and 1 small livestock farm. Available data shows no large livestock operations involved with tract lands.

Forty percent of the land within the tract was leased by 6 operators. Three operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm incomes for representative farms are \$41,550 (small crop), \$52,469 (crop-livestock), and \$91,900 (small livestock). The average for the 7 Antelope farms is \$53,400. Net farm incomes are \$12,100, \$19,600, and \$10,900 respectively for the three farm types. The average for all farms is \$15,100 per farm. Current farm operating expenses are \$38,300 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farms assume a 60 cow base herd with cow-calf operation. On this type of farm, about 36 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural production that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Antelope tract is 50 years with a 10-year reclamation period. The peak year mining period is 40 years. The peak years would involve 20 percent of the tract acreage. Some of the land would be involved in mining operations for 60 years.

On an average basis there would be 74 acres of the land under consideration removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$4,080. During the peak mining years, 740 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$40,800 annually. This value would be about 0.24 percent of the value of Mercer County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$11,400 annually. The present value of this loss over the life of the mine would be \$76,500. The present value of net agricultural income loss per million tons of coal mined would be \$970.

Farm—Ranch Operations

During the peak mining years that the 740 acres would be out of production, the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since all but one operation has over 740 acres within the tract, it is possible that each of these operations during some point in the life of the mine could have all of its land within the tract out of production. The consequences of this are shown on Table 1. One operator has 140 acres of land more than would be out of production during peak mining. This would result in about 84 percent of the operator's intract acres being out of production during peak mining.

The largest number of farm/ranch operations fall in the small cash grain (2 with 76 to 100 percent reduction) and crop-livestock classes (2 with a minor amount to 25 percent reduction). Farm/ranch net income in these classes could be reduced by about \$15,700 or over 100 percent and \$3,800 or 35 percent respectively. As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income from about \$19.05 for the small crop farms and \$8.00 per acre for the crop-livestock farms. The present value of losing this income in perpetuity at 10 percent

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
ANTELOPE TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	0	3,900	0	8,000	1	12,200	2	15,700 ³
Large Cash Crop	1,895	94,500	19,600	0	7,200	0	15,400	0	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	2	3,800	1	8,200	0	12,900	0	17,000
Small Livestock	4,490	91,900	8,800	0	2,700	0	7,100	1	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

interest would be about \$190.00 and \$80.00 per acre respectively.

Overall reduction in net income averages \$15.45 per acre for all operators under consideration in the tract.

Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation. Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$525 per acre in the Antelope tract.

Based on this analysis it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated up to eight times as much as he or she might lose in agricultural income, even assuming no reclamation. Approximately 73 percent of the land operated by the 7 affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the average of \$15.45 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid.

This amounts to about \$10 per acre annually for the small crop farm.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 24, Antelope Site Specific Analysis) mentions that two to three known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 109 farm operators in Mercer County reported working 200 days or more off the farm. This is 19 percent of the total farm operators in the county.

Impacts on directly affected farmers and ranchers

would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

WERNER TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 12,843 acres of tract lands is \$313,900 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$24.24 per acre. The value of all agricultural production for Dunn County, in which this Werner tract is located, was \$27,908,000 in 1978.

Farm—Ranch Operations

The tract contains 12,843 acres of farm land operated by 20 ranchers and farmers who also operate 30,113 acres of land outside the tract (Table 5, Werner Site Specific Analysis). The average farm operation contains 2,165 acres of which 1,038 acres are hay and grain, 1,011 acres pasture, 99 acres fallow, and 17 acres other.

On the basis of a representative farm classification, the 20 farms are classified as 10 small crop farms, 7 combination crop-livestock farms, and 3 small livestock farms. Available data shows no large livestock operations involved with tract lands.

Fifty-nine percent of the land within the tract was leased by 12 operators. Nine operators leased all the land operated by them in the tract.

Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm incomes for representative farms are \$41,500 (small crop), \$52,500 (crop-livestock), and \$91,900 (small livestock). The average for the 20 Werner farms is \$52,900. Net farm incomes are \$12,100, \$19,600, \$10,900, and \$8,800 respectively for the three farm types. The average for all farms is \$11,200 per farm. Current farm operating expenses are \$41,700 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farms a 200 cow herd with cow-calf operations. On the crop-livestock farm, about 36 percent of the gross income is from sale of calves and cull cows. On small livestock farms, this figure is 69 percent.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural pro-

duction that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Werner tract is 40 years with a 10-year reclamation period. The peak year mining period is 30 years. The peak years would involve 25 percent of the tract acreage. Some of the land would be involved in mining operations for 50 years.

On an average basis there would be 320 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$7,840. During the peak mining years 5,200 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$78,400 annually. This value would be about .28 percent of the value of Dunn County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$21,800 annually. The present value of the loss over the life of the mine at 10 percent interest would be \$144,400. The present value of the net agricultural income loss per million tons would be \$500.

Farm—Ranch Operations

During the peak mining years 3,200 acres would be out of production and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since no operation has over 3,200 acres within the tract, it is possible that each operation at some point in the life of the mine could have all of its land within the tract out of production. The consequences of this are shown on Table 1. The largest number of farm/ranch operations (5 each) fall in the small cash grain class and crop-livestock class with a potential reduction in size of a very minor amount up to 25 percent. Farm/ranch net income in these two classes could be reduced by about \$3,900 and \$3,800 respectively, with a 25 percent proportional reduction in acreage owned and leased. As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income of about \$18.57 per acre for the cash crop farms and \$8.00 per acre for the crop-livestock farms. The present value of losing this income in perpetuity at 10 percent interest would be about \$185 and \$80 per acre respectively.

Overall reduction in net income averages \$6.80 per acre for all operators in the tract.

Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
WERNER TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	5	3,900	2	8,000	2	12,200	1	15,700 ³
Large Cash Crop	1,895	94,500	19,600	0	7,200	0	15,400	0	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	5	3,800	1	8,200	0	12,900	1	17,000
Small Livestock	4,490	91,900	8,800	2	2,700	0	7,100	1	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2 ¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$475 per acre in the Werner tract.

Based on this analysis it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation.

Approximately 70 percent of the land operated by the 20 affected farmers/ ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than if the land were owned. Lost income would be the profit that is now being realized from the lease after the rent is paid. This amounts to about \$10 per acre annually for the small crop farm.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 24, Werner Site

Specific Analysis) mentions that between 14 and 20 known wells in and outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new offfarm job opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 85 farm operators in Dunn County reported working 200 days or more off the farm. This is 11 percent of the total farm operators in the county.

DEER CENTER TRACT

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no

programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

The impact of the proposed action on the agricultural economy of the area is discussed in the report. The report is available to the public and is located in the BLM office in the area. The report is titled "Agricultural Economic Analysis of the Proposed Action on the Deer Center Tract."

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Public-Private Operations

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DUNN CENTER TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 30,064 acres of tract lands is \$1,038,000 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$34.52 per acre. The value of all agricultural production for Dunn County, in which this Dunn Center tract is located, was \$27,908,000 in 1978.

Farm—Ranch Operations

The tract contains 30,064 acres of farm land operated by 49 ranchers and farmers who also operate 48,920 acres of land outside the tract (Table 5, Dunn Center Site Specific Analysis). The average farm operation contains 1,624 acres of which 696 acres are hay and grain, 766 acres pasture, 150 acres fallow, and 12 acres other.

On the basis of a representative farm classification, the 49 farms are classified as 26 small crop farms, 2 large crop farms, 20 combination crop-livestock farms and one small livestock farm. Available data shows no large livestock operations involved in tract lands.

Forty-eight percent of the land within the tract was leased by 25 operators. Eighteen operators leased all the land operated by them in the tract.

Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm incomes for representative farms are \$41,500 (small crop), \$94,500 (large crop), \$52,500 (crop-livestock), and \$91,900 (small livestock). The average for the 49 Dunn Center farms is \$49,200. Net farm incomes are \$12,100, \$19,600, \$10,900, and \$8,800 respectively for the four farm types. The average for all farms is \$11,800 per farm. Current farm operating expenses are \$37,400 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely farm sale of crops. The crop-livestock farms assume a 60 cow base herd and the small livestock farm a 200 cow herd with cow-calf operations. On the crop-livestock farm, about 36 percent of the gross income is from sale of calves and cull cows. On the small livestock farm, about 69 percent is from livestock sales.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural production that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Dunn Center tract is 60 years with a 10-year reclamation period. The peak year mining period is 50 years. The peak years would involve 17 percent of the tract acreage. Some of the land would be involved in mining operations for 70 years.

On an average basis there would be 500 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$17,640. During the peak mining years 5,000 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$176,400 annually. This value would be about .63 percent of the value of Dunn County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$59,500 annually. The present value of the loss over the life of the mine at 10 percent interest would be \$900,900. The present value of net agricultural income loss per million tons of coal mined would be \$480.

Farm—Ranch Operations

During the peak mining years that the 5,000 acres would be out of production, the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since no operation has over 5,000 acres within the tract, it is possible that each operation at some point during the life of the mine could have all of its land within the tract out of production. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (16) fall in small cash crop class with 76 to 100 percent reduction in acreage. These would be the most severely impacted.

The second largest number of operations (8) fall in the crop and livestock class with a potential reduction in size of a very minor amount up to 25 percent. Farm/ranch net income in this class could be reduced by about \$3,800 or 35 percent of present net income with a 25 percent proportional reduction in acreage owned and leased. As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income of about \$8.00 per acre. The

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
DUNN CENTER TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	3	3,900	4	8,000	3	12,200	16	15,700 ³
Large Cash Crop	1,895	94,500	19,600	1	7,200	1	15,400	0	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	8	3,800	6	8,200	4	12,900	2	17,000
Small Livestock	4,490	91,900	8,800	1	2,700	0	7,100	0	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

present value of losing this income in perpetuity at 10 percent interest would be \$80.00 per acre.

Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

The overall reduction in net income averages \$11.90 per acre for all operators in the tract.

Impact on strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation. Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$650 per acre in the Dunn Center tract.

Based on this analysis it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. Approximately 62 percent of the land operated by the 49 affected farmers/ranchers lies outside the tract. Depending upon the level of compensa-

tion and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$8.00 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 28, Dunn Center Site Specific Analysis) mentions that between 15 and 25 known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and

increased traffic on narrow rural roads.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 85 farm operators in Dunn County reported working 200 days or more off the farm. This is 11 percent of the total farm operators in the county.

Also, as agricultural land is taken out of production, there would be a small decrease in the need for farm labor. This would amount to about 11,000 hours annually during peak mining.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

TRUAX TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 23,813 acres of tract lands is \$1,106,400 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$46.46 per acre. The value of all agricultural production for Mercer County, in which this Truax tract is located, was \$16,954,000 in 1978.

Farm—Ranch Operations

The tract contains 23,813 acres of farm land operated by 56 ranchers and farmers who also operate 40,919 acres of land outside the tract (Table 5, Truax Site Specific Analysis). The average farm operation contains 1,156 acres of which 506 acres are hay and grain, 437 acres pasture, and 213 acres of fallow and other.

On the basis of a representative farm classification, the 56 farms are classified as 45 small crop farms, 4 large crop farms, and 7 combination crop-livestock farms. Available data shows no large livestock operations involved with tract lands.

Forty-nine percent of the land within the tract was leased by 38 operators. Nine operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm incomes for representative farms are \$41,500 (small crop), \$94,500 (large crop) and \$52,500 (crop-livestock). The average for the 56 Truax farms is \$46,700. Net farm incomes are \$12,000, \$19,600, and \$10,900 respectively for the three farm types. The average for all farms is \$11,700 per farm. Current farm operating expenses are \$35,000 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farms assume a 60 cow base herd with cow-calf operation. On this type of farm, about 36 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural pro-

duction that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Truax tract is 50 years with a 10-year reclamation period. The peak year mining period is 40 years. The peak years would involve 20 percent of the tract acreage. Some of the land would be involved in mining operations for 60 years.

On an average basis there would be 476 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$22,100. During the peak mining years 4,760 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$221,000 annually. This value would be about .13 percent of the value of Mercer County's annual agricultural production.

Loss in net agricultural income (value) during peak mining would be \$80,500. The present value of the loss over the life of the mine at 10 percent interest would be \$329,500. The present value of net agricultural income loss per million tons mined would be \$1,165.

Farm—Ranch Operations

During the peak mining years that the 4,760 acres would be out of production, the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since no operation has over 4,760 acres within the tract, it is possible that each operation at some point during the life of the mine could have all of its land within the tract out of production. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (16) fall in the small cash grain class with a potential reduction in size of 76 to 100 percent. The impact on these operations would be the most severe. If all the land is taken out of production, the loss in net income would amount to \$15,700 in the small cash crop class. This is \$3,700 more than present net income because it is assumed that operators would maintain equipment, etc., until farming could start again.

As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income of about \$18.57 per acre. The present value of losing this income in perpetuity at 10 percent interest would be about \$185 per acre.

Overall reduction in net income averages \$16.92 per acre for all operators in the tract.

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
TRUAX TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	8	3,900	13	8,000	8	12,200	16	15,700 ³
Large Cash Crop	1,895	94,500	19,600	4	7,200	0	15,400	0	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	6	3,800	1	8,200	0	12,900	0	17,000
Small Livestock	4,490	91,900	8,800	0	2,700	0	7,100	0	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

Impact on strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$300 per acre in the Truax tract.

Based on this analysis it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. Approximately 63 percent of the land operated by the 56 affected farmers/ ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$18.57 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid. This amounts to about \$10 per acre annually for the small crop farm. Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining.

The effects on these operators, though, are much more difficult to trace. Wells outside the tract boundaries could experience water level lowering. There is also a potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 109 farm operators in McLean County reported working 200 days or more off the

farm. This is 19 percent of the total farm operators in the county. Also, as agricultural land is taken out of production, there would be a small decrease in the need for farm labor. This would amount to about 7,500 hours annually during peak mining years.

to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

SAKAKAWEA TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 1,360 acres of tract lands is \$64,000 annually. Most of this total comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$47.06 per acre. The value of all agricultural production for McLean County, in which this Sakakawea tract is located, was \$39,585,000 in 1978.

Farm—Ranch Operations

The tract contains 1,360 acres of farm land operated by 7 ranchers and farmers who also operate 5,217 acres of land outside the tract (Table 4, Sakakawea Site Specific Analysis). The average farm operation contains 940 acres of which 438 acres are hay and grain, 277 acres pasture, 223 acres fallow, and 2 acres other.

On the basis of a representative farm classification, the 7 farms are classified as 7 small crop farms.

Forty-seven percent of the land within the tract was leased by 26 operators. Three operators leased all the land operated by them in the tract.

Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm incomes for representative farms are \$41,500 (small crop). Net farm income is \$12,100 for the farm type. Current farm operating expenses are \$29,400 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural production that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Sakakawea tract is 40 years with a 10-year reclamation period. The peak year mining period is 30 years. The peak years would involve 25 percent of the tract acreage. Some of the land would be involved in mining operations for 50 years.

On an average basis there would be 34 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$1,530. During the peak mining years 340 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$15,300 annually. This value would be about 0.04 percent of the value of McLean County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$5,700 annually. The present value of the loss over the life of the mine at 10 percent interest would be \$37,800. The present value of net agricultural income loss per million tons of coal mined would be \$4,780.

Farm—Ranch Operations

During the peak mining years 340 acres would be out of production and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since all but one operation has under 320 acres within the tract, it is possible that each of these six operations could have all of their land within the tract out of production at some point during the mine life. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (4) fall in the small cash grain class with a potential reduction in size of a very minor amount up to 25 percent. Farm/ranch net income in this class could be reduced by about \$3,900 or 32 percent with a 25 percent proportional reduction in acreage owned and leased. As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income of about \$18.57 per acre. The present value of losing this income in perpetuity at 10 percent interest would be \$185.70 per acre.

Reduction in net income averages \$16.68 per acre for all operators during the peak years.

Impact on strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned ver-

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
SAKAKAWEA TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	4	3,900	2	8,000	1	12,200	0	15,700 ³
Large Cash Crop	1,895	94,500	19,600	0	7,200	0	15,400	0	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	0	3,800	0	8,200	0	12,900	0	17,000
Small Livestock	4,490	91,900	8,800	0	2,700	0	7,100	0	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

sus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$160 per acre in the Sakakawea tract.

Based on this analysis it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated up to eight times as much as he or she might lose in agricultural income, even assuming no reclamation. Approximately 79 percent of the land operated by the 7 affected farmers/ ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$18.57 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid. This amounts to about \$10 per acre annually for the small crop farm.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 188 farm operators in McLean County reported working 200 days or more off the farm. This is 15 percent of the total farm operators in the county.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 10, Sakakawea Site Specific Analysis) mentions that more than 20 known wells in and outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

The technical report is available which discusses the methodology used in the agricultural economic analysis.

GLENHAROLD TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently, the value of agricultural production on the 12,442 acres of tract lands is \$441,000 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$35.44 per acre. The value of all agricultural production for Oliver County, in which most of Glenharold tract is located, was \$12,579,000 in 1978.

Farm—Ranch Operations

The tract contains 12,442 acres of farm land operated by 26 ranchers and farmers who also operate 27,842 acres of land outside the tract (Table 4, Glenharold Site Specific Analysis). The average farm operation contains 1,549 acres of which 192 acres are hay, 373 acres grain, 945 acres pasture, and 39 acres fallow.

On the basis of a representative farm classification, the 26 farms are classified as 14 small crop farms, 6 combination crop-livestock farms, and 6 small livestock farms. Available data shows no large livestock operations or large crop farms involved within the tract.

Thirty-one percent of the land within the tract was leased by 14 operators. Eight operators leased all the land operated by them in the tract.

Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm incomes for representative farms are \$41,500 (small crop), \$52,500 (crop-livestock), and \$91,900 (small livestock). The average for the 26 Glenharold farms is \$55,700. Net farm incomes are \$12,100, \$10,900 and \$8,800 respectively for the three farm types. The average for all farms is \$11,000 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farms assume a 60 cow base herd and the small livestock farms a 200 cow herd with cow-calf operations. On the croplivestock farm about 36 percent, and on the small livestock farms 69 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural pro-

duction that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Glenharold tract is 52 years with a 10-year reclamation period. The peak year mining period is 42 years. The peak years would involve 19 percent of the tract acreage. Some of the land would be involved in mining operations for 52 years.

On an average basis there would be 240 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$8,400. During the peak mining years 2,400 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$84,000 annually. This value would be about 0.67 percent of the value of Oliver County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$20,800. The present value of the loss over the life of the mine at 10 percent interest would be \$139,000. The present value of net agricultural income loss per million tons coal mined would be \$700.

Farm—Ranch Operations

During the peak mining years 2,400 acres would be out of production and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since no operation has over 2,400 acres within the tract, it is possible that each operator could have all of his or her land within the tract out of production at some time in the mining process. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (6) fall in the small cash grain class with a potential reduction in size of 26 to 50 percent. Farm/ranch net income in this class could be reduced by about \$8,000 or 66 percent with a 50 percent proportional reduction in acreage owned and leased. As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income of about \$1,904 per acre. The present value of losing this income in perpetuity at 10 percent interest would be \$190 per acre.

Overall, the average reduction in net farm income averages \$8.65 per acre for all operators in the tract. Impact of strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
GLENHAROLD TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	5	3,900	6	8,000	1	12,200	2	15,700 ¹
Large Cash Crop	1,895	94,500	19,600	0	7,200	0	15,400	0	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	2	3,800	3	8,200	1	12,900	0	17,000
Small Livestock	4,490	91,900	8,800	2	2,700	2	7,100	2	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$300 per acre in the Glenharold tract.

Based on this analysis it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated up to eight times as much as he or she might lose in agricultural income, even assuming no reclamation. Approximately 69 percent of the land operated by the 26 affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$19.04 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid. This amounts to about \$10 per acre annually for the small crop farm.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 26, Glenharold Site Specific Analysis) mentions that between 10 and 25 known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many

unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors. Operator and family labor would be reduced about 1,500 hours and hired farm labor about 2,400 hours annually during peak mining.

Operators of small farms at the same time may take advantage of the new off-farm opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 75 farm operators in Oliver County reported working 200 days or more off the farm. This is 19 percent of the total farm operators in the county.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

A technical report is available which discusses the methodology used in the agricultural economic analysis.

GARRISON TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

Presently the value of agricultural production on the 16,872 acres of tract lands is \$754,500 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$44.72 per acre. The value of all agricultural production for McLean County, in which this Garrison tract is located, was \$39,585,000 in 1978.

Farm—Ranch Operations

The tract contains 16,872 acres of farm land operated by 37 ranchers and farmers who also operate 31,649 acres of land outside the tract (Table 5, Garrison Site Specific Analysis). The average farm operation contains 1,311 acres of which 573 acres are hay and grain, 348 acres pasture, 360 acres fallow, and 30 acres other.

On the basis of a representative farm classification, the 37 farms are classified as 29 small crop farms, 6 large crop farms, and 2 combination crop-livestock farms. Available data shows no large livestock operations involved with tract lands.

Fifty-eight percent of the land within the tract was leased by 26 operators. Eighteen operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm incomes for representative farms are \$41,500 (small crop), \$94,500 (large crop) and \$52,500 (crop-livestock). The average for the 37 Garrison farms is \$50,700.

Net farm incomes are \$12,100, \$19,600, and \$10,900 respectively for the three farm types. The average for all farms is \$13,200 per farm. Current farm operating expenses are \$37,500 per farm. These incomes are available for family labor and return on investment.

Livestock is not included on the crop farms, so gross farm income is entirely from sale of crops. The crop-livestock farms assume a 60 cow base herd with cow-calf operation. On this type of farm, about 36 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural pro-

duction that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Garrison tract is 40 years with a 10-year reclamation period. The peak year mining period is 30 years. During the peak years, 25 percent of the tract acreage would be displaced from agricultural use. Some of the land would be involved in mining operations for 50 years.

On an average basis there would be 422 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$18,880. During the peak mining years 4,220 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$188,800 annually. This value would be about 0.48 percent of the value of McLean County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$66,000 annually. The present value of this loss over the life of the mine at 10 percent interest would be \$437,100. The present value of the net agricultural income loss per million tons of coal mined would be \$1,686.

During the peak mining years 4,220 acres would be out of production and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since no operation has over 4,220 acres within the tract, it is possible that each operation during the life of the mine could have all of its land within the tract out of production. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (14) fall in the small cash grain class with a potential reduction in size of a very minor amount up to 25 percent. Farm/ranch net income in this class could be reduced by about \$3,900 or 32 percent with a 25 percent proportional reduction in acreage owned and leased. As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income of about \$18.57 per acre. The present value of losing this income in perpetuity at 10 percent interest would be \$185.70 per acre.

The overall reduction in net income averages \$15.63 per acre annually for all operators in the tract. Impact of strip mining on the operation and management of livestock ranches could be more severe than on dry-land farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, live-

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
GARRISON TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	14	3,900	5	8,000	5	12,200	5	15,700 ³
Large Cash Crop	1,895	94,500	19,600	2	7,200	3	15,400	0	24,000	1	31,900
Crop & Livestock	1,900	52,500	10,900	1	3,800	0	8,200	0	12,900	1	17,000
Small Livestock	4,490	91,900	8,800	0	2,700	0	7,100	0	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

stock water supplies and distribution, and in general disrupt the overall operation.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned vs. leased. New surface leases that are presently being signed could result in compensating land owners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$320 per acre in the Garrison tract.

Based on this analysis, it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated up to eight times as much as he or she might lose in agricultural income, even assuming no reclamation. Approximately 65 percent of the land operated by the 37 affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract.

Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$18.57 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid. This amounts to about \$10 per acre annually for the small crop farm.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 13, Garrison Site Specific Analysis) mentions that there are approximately 75 wells in and outside the tract boundaries that could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a live-

stock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 188 farm operators in McLean county reported working 200 days or more off the farm. This is 16 percent of the total farm operators in the county. Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

The technical report is available which discusses the methodology used in the agricultural economic analysis.

CENTER TRACT

AFFECTED ENVIRONMENT

Value of Agricultural Production

The assessment covers agricultural land in those farm/ranch operations which have some part of their land within the tract over federal coal. Presently the value of agricultural production on these 3,043 acres of tract lands is \$78,700 annually. This total primarily comes from small grains, hay, pasture and livestock production. The value of agricultural production for the tract averages \$25.86 per acre. The value of all agricultural production for Oliver County, in which this Center tract is located, was \$12,579,000 in 1978.

Farm—Ranch Operations

There are 3,043 acres of farm land operated by 6 ranchers and farmers who have some part of their land over federal coal. They also operated 8,920 acres of land outside the tract (Table 4, Center Site Specific Analysis). The average farm operation contains 1,994 acres of which 744 acres are hay and grain, 1,134 acres pasture, and 116 acres fallow.

On the basis of a representative farm classification, the 6 farms are classified as combination crop-livestock farms. Available data shows no large livestock operations involved with tract lands.

Seventy-six percent of the land within the tract was leased by 4 operators. Three operators leased all the land operated by them in the tract. Representative farms used in the income analysis assume 52 percent leasing of all operated land.

The gross farm income for the representative farm is \$52,500 (crop-livestock). Net farm income is \$10,900 for the farm type. Current farm operating expenses are \$41,600 per farm. These incomes are available for family labor and return on investment.

The crop-livestock farms assume a 60 cow base herd with cow-calf operation. On this type of farm, about 36 percent of the gross income is from sale of calves and cull cows.

ENVIRONMENTAL CONSEQUENCES

Value of Agricultural Production

Concern has been expressed over the agricultural production that would be displaced if coal were mined. Expressing such losses in dollar terms enables us to gain more perspective in judging their significance.¹

The mining period for the Center tract is 50 years with a 10-year reclamation period. The peak year mining period is 40 years. The peak years would involve 20 percent of the tract acreage. Some of the land would be involved in mining operations for 60 years.

On an average basis there would be 61 acres of land removed from production each year during the development period which would result in an annual reduction in value of agricultural production of \$1,570. During the peak mining years 610 acres of land would be removed from agriculture and the value of agricultural production would be reduced by \$15,700 annually. This value would be about 0.5 percent of the value of Oliver County's annual agricultural production.

Loss in net agricultural income during peak mining would be \$5,700 annually. The present value of this loss over the life of the mine would be \$38,200. The present value of net agricultural income loss per million tons of coal mined would be \$660.

Farm—Ranch Operations

During the peak mining years 610 acres would be out of production and the impact on individual farms/ranches would vary widely. Table 1 shows the number of farm/ranch operations by class and the extent to which each could be affected by coal mining during the peak mining year. Since no operation has over 610 acres within the tract, it is possible that each operation at some point during the life of the mine could have all of its land within the tract out of production. The consequences of this are shown on Table 1.

The largest number of farm/ranch operations (4) fall in the crop-livestock class with a potential reduction in size of a very minor amount up to 25 percent. Farm/ranch net income in this class could be reduced by about \$3,800 or 35 percent of present net income with a 25 percent proportional reduction in acreage owned and leased. As stated earlier, this model is based on owning 48 percent of the land affected and leasing the other 52 percent. This results in an average annual reduction in net income of about \$8.00 per acre. The present value of losing this income in perpetuity at 10 percent interest would be \$80.00 per acre.

Overall reduction in net income averages \$9.30 per acre for all operations under consideration in this tract.

Impact on strip mining on the operation and management of livestock ranches could be more severe than on dryland farming. Mine development located near the center of a ranch could seriously interfere with movement of livestock, fencing and pasture arrangements, livestock water supplies and distribution, and in general disrupt the overall operation.

¹McMartin, Wallace; Whetzel, Virgil; Myers, Paul. *Coal Development in Rural America, The Resources at Risk*, Economic Research Service Report No. 29, U.S. Department of Agriculture, August 1981.

TABLE 1
IMPACT ON FARM/RANCH OPERATIONS OF REDUCING LAND ACREAGE DUE TO COAL MINING
CENTER TRACT

Representative Farm	Present Situation			Percentage Reduction in Farm/Ranch Acreage							
	Acres in Farm	Gross Farm Income (\$)	Net Farm Income (\$)	0 - 25		26 - 50		51 - 75		76 - 100	
				Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²	Number Operations ¹	Reduced Net Farm Income ²
Small Cash Crop	840	41,500	12,100	0	3,900	0	8,000	0	12,200	0	15,700 ³
Large Cash Crop	1,895	94,500	19,600	0	7,200	0	15,400	0	24,000	0	31,900
Crop & Livestock	1,900	52,500	10,900	4	3,800	1	8,200	1	12,900	0	17,000
Small Livestock	4,490	91,900	8,800	0	2,700	0	7,100	0	12,800	0	19,100

Source: Economic Research Service, U.S. Department of Agriculture.

¹Number of farm/ranch operations whose acreage would be reduced from 0-25 percent, 26-50 percent, 51-75 percent, and 76-100 percent, respectively.

²Reduction per farm from present net farm income with 25 percent, 50 percent, 75 percent, and 100 percent reduction in farm/ranch acreage.

³The reduction in net farm income with 100 percent acreage reduction is more than present net farm income because it is assumed that the operators would maintain machinery and equipment until the land can be farmed again.

Compensation to the farm/ranch operator would vary depending upon the type of landowner lease, land ownership pattern, and percentage of land owned versus leased. New surface leases that are presently being signed could result in compensating landowners up to as high as \$1,500 per acre if crop land is involved. Older leases were signed for as low as \$1 per acre annual rental with 2¢ per ton royalty rate to surface owners. Under these terms, compensation could average about \$460 per acre in the Center tract.

Based on this analysis it appears that a farm/ranch operator that owns 48% of the land affected by mining could be compensated many times more than he or she might lose in agricultural income, even assuming no reclamation. Approximately 75 percent of the land operated by the 6 affected farmers/ranchers lies outside the tract. Depending upon the level of compensation and land ownership pattern many operators could, in effect, be receiving compensation for any impacts adjacent to the coal tract. Operators that have only lease land within the tract would not be compensated for the lost leases. Loss in income though, would be less than the \$800 per acre. Lost income would be the profit that is now being realized from the lease after the rent is paid.

Those farmers and ranchers whose land is not directly taken out of production but are located in the general area, could also be affected by coal mining. The effects on these operators, though, are much more difficult to trace. The hydrology section (page 20, Center Site Specific Analysis) mentions that five or six known wells outside the tract boundaries could experience water level lowering. It also mentions the potential for water quality degradation. Reduction in water quality and the level of wells would affect the operations of farms/ranches and their costs. If a livestock well went dry and could not be replaced, this could cause the livestock to trail further. Also, areas affected may only be grazed lightly or not at all. There are too many unknowns at this

point in time, though, to evaluate in every detail how this "off-site" impact might affect farm/ranch operations and cost. Impacts to water quality and quantity could be mitigated through the law. If a farmer or rancher could prove that coal mining is affecting his or her water resource there is a potential for recovering damages based on the illegal taking of a property right. (Field Solicitor—U.S. Department of Interior.)

Coal mine development can also cause "people" problems for area farmers and ranchers. Of major concern is affect on lifestyle and general nuisance caused by increased population. This includes such things as theft, trespassing, gates left open, vandalism and increased traffic on narrow rural roads.

Strip mining will compete directly with agriculture for labor resources as both industries place a premium on workers in their physical prime who are accustomed to working with machinery and to working long hours outdoors.

Operators of small farms at the same time may take advantage of the new off-farm job opportunities that the coal industry provides. This would allow a shift for themselves and their families into higher levels of income while operating their farms on a part-time basis. In 1978, a total of 75 farm operators in Oliver County reported working 200 days or more off the farm. This is 19 percent of the total farm operators in the county.

Impacts on directly affected farmers and ranchers would be mitigated to the extent they are compensated. The Department of Agriculture has programs available to help mitigate some impacts. These, of course, are available to all farmers and ranchers. The BLM has no programs within its jurisdiction to mitigate impacts to individual farmers and ranchers.

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